

WE CLAIM:

1. An electrochemically reacting composition comprising active materials aluminum magnesium and iron, a filler material such as silica sand, a hydrogen scavenger such as potassium permanganate, additive such as sodium silicate and an electrolyte such as sodium chloride;
wherein said magnesium comprises 10-90% by weight of the said active materials,
wherein said aluminum comprises 10-90% by weight of the said active materials,
wherein said iron comprises 0-15% by weight of the said active materials,
wherein said filler material silica sand comprises 5-50% by weight of the said active materials,
wherein said hydrogen scavenger potassium permanganate comprises 5-30% by weight of the said composite materials,
wherein said additive sodium silicate comprises 0-20% by weight of the said active materials.
2. A composition as claimed in claim 1 wherein said magnesium comprises 15-50% by weight with a particle size varying from 1-500 μm .
3. A composition as claimed in claim 1 wherein said aluminium comprises 40-75% by weight with a particle size varying from 2-100 μm .

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4. A composition as claimed in claim 1 wherein said iron comprises 7-12% by weight with a particle size varying from 20-200 μm .

5. A composition as claimed in claim 1 wherein said silica comprises 5-25% by weight of said active materials.

5 6. A composition as claimed in claim 1 wherein said potassium permanganate comprises preferably 5-20% by weight of the said composite materials.

7. A composition as claimed in claim 1 wherein said sodium silicate comprises preferably 0-10% by weight of said active materials.

10 8. A composition as claimed in claim 1, wherein copper chloride, or ferric chloride, or preferably, potassium permanganate can be used as said hydrogen scavenger.

9. A composition as claimed in claim 1, wherein said salt is a salt of strong acid and strong/weak base such as potassium chloride, ferrous sulphate preferably sodium chloride.

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10. A process for the preparation of an electrochemically reacting composition as claimed in claim 1, comprising following steps:

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- (i) preparing active materials by placing commercially available 10-90%, preferably 15-50% magnesium, having particle size varying from 1-500 μm , by weight of the entire active materials, 10-90% preferably 40-75% aluminium, having particle size varying from 2-100 μm , by weight of the entire active materials, and 0-15% preferably 7-12% iron, having particle size varying from 20-200 weight wise

of the entire active materials in the container of a conventional ball mill;

(ii) adding to the said active materials a filler material such as silica sand 5-50% preferably 5-25% weight wise over the weight of the said active materials;

(iii) ball milling the mix of the said active materials and the said filler material for about 4-6 hours preferably under the inert atmosphere of argon and transferring the entire mix to another container after completion of the ball milling operation;

(iv) adding a hydrogen scavenger such as copper chloride, ferric chloride preferably potassium permanganate 5-30% preferably 5-20% weight wise over the entire weight of the active materials and mixing thoroughly to obtain a homogenous mix;

(v) adding additive sodium silicate 2-20% preferably 2-10% weight wise over the entire active materials to the homogenous mix obtained from step (iv);

(vi) adding any salt of strong acid and strongly/weak base such as potassium chloride, ferrous, sulphate preferably sodium chloride 2-10% preferably 5-10% weight wise over the weight of the entire active materials to the mix obtained from step (v);

(vii) compacting of the entire mix obtained from step (v) through a conventional pressing machine and giving it a desirable shape such as strip or pellet;

- (viii) storing the compacted and cut electrochemical heat source in air tight containers such as pouch to avoid ingress of water.